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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

MCDONALD, RODNEY GLENN

ART UNIT	PAPER NUMBER
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1795

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/518,695	Applicant(s) BOXHOORN ET AL.	
	Examiner Rodney G. McDonald	Art Unit 1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 December 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-50 is/are pending in the application.
- 4a) Of the above claim(s) 34-50 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-33 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>12/04</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 2, line 3, is indefinite because it is unclear if the limitations following the phrase "such as" is meant to further limit the claim.

Claim 7, line 2, is indefinite because "the deposition material" lacks antecedent basis.

Claim 7, line 3, is indefinite because it is unclear if the limitations following the phrase "such as" is meant to further limit the claim.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary.

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Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-7, 16, 18, 21, 27, 29, 30, 31, 32 and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schram et al. (U.S. Pat. 4,871,580) in view of Lauth et al. (U.S. Pat. 5,559,065).

Regarding claim 1, Schram et al. teach a method for depositing a layer on a substrate. (See Abstract) Introducing a substrate into a processing chamber. (Column 4 lines 56-61) Generating at least one plasma by at least one plasma cascade source. (Column 7 lines 12-15) Depositing at least one deposition material on the substrate under the influence of plasma. (See Abstract; Column 4 lines 64-68; Column 5 lines 1-12) Depositing at least a second deposition material on the substrate by at least a sputtering source. (Column 5 lines 33-38; Column 6 lines 53-65)

Regarding claim 2, Schram et al. teach the deposition material supplied outside the at least one plasma source into the processing chamber to the plasma in the processing chamber. (Column 4 lines 64-68; Column 5 lines 1-12)

Regarding claim 3, Schram et al. teach at least one volatile compound of the deposition material supplied to the plasma for the deposition. (Column 4 lines 64-68; Column 5 lines 1-12)

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Regarding claim 4, Schram et al. teach the volatile compound contains at least one precursor material which decomposes in the processing chamber in material to be deposited before the material has reached the substrate. (Column 4 lines 64-68; Column 5 lines 1-12; Abstract)

Regarding claim 5, Schram et al. teach at least one sputtering electrode which comprises the deposition material arranged in the processing chamber and the plasma is contacted with each sputtering electrode to sputter the substrate with material. (Column 5 lines 33-38; Column 6 lines 53-65)

Regarding claim 6, Schram et al. teach the plasma passes at least partly through at least one passage of the at least one sputtering electrode to contact the plasma with the electrode. (Column 5 lines 33-38; Column 6 lines 53-65; See Figure 1)

Regarding claim 33, Schram et al. teach adjusting the substrate to a particular treatment temperature. (Column 4 lines 56-61)

The differences between Schram et al. and the present claims is that utilizing the apparatus for manufacturing a catalyst layer is not discussed (Claim 1), utilizing a deposition material comprising at least one catalyst material which after an activation treatment is catalytically active is not discussed (Claim 7), the substrate being substantially non-porous is not discussed (Claim 16), the substrate comprising at least one metal or alloy is not discussed (Claim 18), the substrate being substantially porous is not discussed (Claim 21), wherein the at least one catalyst material is nickel, copper, palladium, rhodium, platinum or iron or any combination thereof is not discussed (Claim 27), wherein a reducing is

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carried out at an elevated temperature for the purpose of reduction of the deposition material deposited on the substrate is not discussed (Claim 29), wherein the reducing step is carried out under the influence of hydrogen is not discussed (Claim 30), wherein an inert gas which contains hydrogen is supplied to the substrate for the purpose of the reduction is not discussed (Claim 31), and wherein the substrate is adjusted to a particular electrical potential by DC, pulsed DC and/or RF biasing is not discussed (Claim 32).

Regarding claim 1, Lauth et al. teach utilizing physical vapor deposition and chemical vapor deposition to form a catalyst layer. (See Abstract) The relevant metal oxide, nitride, carbide is sputtered in the presence of hydrocarbons, oxygen and/or nitrogen in the process gas. (Column 2 lines 48-52) It follows since Schram et al. teach utilizing a gas such as a hydrocarbon and sputtering a metal target that one looking at Lauth et al. would know how to deposit catalyst layers in the apparatus of Schram et al. utilizing the teachings of Lauth et al. (See Schram et al. and Lauth et al. discussed above)

Regarding claim 7, Lauth et al. teach sputtering at least one catalyst material which after an activation treatment is catalytically active. (See Abstract; Column 2 lines 1-10, lines 45-52; Column 4 lines 35-39, lines 62-66)

Regarding claim 16, Lauth et al. teach the substrate to be nonporous. (Column 4 lines 17-18)

Regarding claim 18, Lauth et al. teach the substrate to be a metal. (Column 4 line 16)

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Regarding claim 21, Lauth et al. teach the substrate to be porous.

(Column 4 lines 17-18)

Regarding claim 27, Lauth et al. teach the catalyst material to be palladium, platinum, copper and rhodium. (See Abstract)

Regarding claim 29, Lauth et al. teach a reducing step carried out at an elevated temperature for the purpose of reduction of the deposition material deposited on the substrate. (Column 4 lines 35-39, lines 62-66)

Regarding claim 30, Lauth et al. teach the reducing is carried out under the influence of hydrogen. (Column 4 line 64)

Regarding claim 31, Lauth et al. teach a mixture of gas containing CO₂ and hydrogen for reducing. CO₂ is inert. (Column 4 lines 62-66)

Regarding claim 32, Lauth et al. teach the sputtering can be bias sputtering. A negative bias is applied to the substrate. This could be DC. (Column 2 lines 33-44)

The motivation for utilizing the features of Lauth et al. is that it allows for preparing coated catalysts in a simple manner. (Column 1 lines 66-68)

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified Schram et al. by utilizing the features of Lauth et al. because it allows for preparing coated catalyst in a simple manner.

Claims 8, 9, 13, 14, 15, 20, 22 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schram et al. in view of Lauth et al. as applied to

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claims 1-7, 16, 18, 21, 27, 29, 30, 31, 32 and 33 above, and further in view of Loch et al. (CA 2,297,543).

The differences not yet discussed is where the deposition material comprises at least one carrier material which material is initially suitable to carry a catalyst material is not discussed (Claim 8), the at least one catalyst material and the at least one carrier material are depositing on the substrate by different sources is not discussed (Claim 9), the substrate comprising sheet material is not discussed (Claim 13), the substrate moving in the processing chamber at least in such a way that each time a different part of the substrate makes contact with the plasma is not discussed (Claim 14), the substrate being brought from an environment into the processing chamber and discharge from the processing chamber to the environment while the deposition material is deposited on the substrate in the processing chamber is not discussed (Claim 15), the substrate being corrugated is not discussed (Claim 20), the carrier material being a metal is not discussed (Claim 22) and the carrier material comprising an oxidizing material is not discussed (Claim 23).

Regarding claim 8, Loch et al. teach the deposition material comprises at least one carrier material which material is suitable to carry a catalyst material. (Page 6 last paragraph)

Regarding claim 9, Loch et al. teach the at least one catalyst material and the at least one carrier material are deposited on the substrate by different sources. (Page 5 last paragraph; "sources")

Regarding claim 13, Loch et al. teach the material is sheet material.

(Page 2 second paragraph)

Regarding claim 14, Loch et al. teach the substrate is moved in the processing chamber at least such a way that each time a different part of the substrate makes contact with the plasma. (Page 4 last paragraph; Page 5 paragraph 1)

Regarding claim 15, Loch et al. teach the substrate is brought from an environment into the processing chamber and is discharged from the processing chamber to the environment while the deposition material is deposited on the substrate in the processing chamber. (Page 4 last paragraph; Page 5 paragraph 1)

Regarding claim 20, Loch et al. teach the sheet can be corrugated. (Page 2 paragraph 2; Page 9 paragraph 2)

Regarding claim 22, Loch et al. teach the substrate is metal. (Page 9 paragraph 2)

Regarding claim 23, Loch et al. teach the carrier material comprising an oxidizing material. (Page 6 last paragraph)

The motivation for utilizing the features of Loch et al. is that it allows for producing catalyst with large surfaces. (Page 2 top page)

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have utilized the features of Loch et al. because it allows for producing catalyst with large surfaces.

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Claims 24-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schram et al. in view of Lauth et al. and Loch et al. as applied to claims 1-9, 13-16, 18, 20-23, 27 and 29-33 above, and further in view of Carcia (U.S. Pat. 4,536,482).

The differences not yet discussed are where the carrier material comprising a semiconductor material (Claim 24), where the carrier material is an oxidized semiconductor material (Claim 25) and where the carrier material further contains a heat-conducting material (Claim 26).

Regarding claims 24, 25, the carrier material can be a semiconductor material or oxidized semiconductor material. (Column 2 lines 56-59; Column 2 lines 66-68)

Regarding claim 26, the carrier material further contains a heat-conducting material. (Column 2 lines 56-59; Column 2 lines 66-68)

The motivation for utilizing the features of Carcia is that it allows for producing catalyst with good catalytic activity and selectivity. (Column 2 lines 32-35)

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have utilized the features of Carcia because it allows for producing catalyst with good catalytic activity and selectivity.

Claims 10-12, 17 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schram et al. in view of Lauth et al. as applied to claims 1-7, 16, 18, 21, 27, 29, 30, 31, 32 and 33 above, and further in view of Carcia (U.S. Pat. 4,536,482).

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The differences not yet discusses is where the sputtering electrode contains at least a part of both a catalyst material and a carrier material is not discussed (Claim 10), the sputtering electrode containing compressed powders of the catalyst and carrier materials to be deposited on the substrate is not discussed (Claim 11), the sputtering electrode containing an alloy of the catalyst material and the carrier material is not discussed (Claim 12), the substrate comprising at least one carrier material is not discussed (Claim 17), and wherein the deposition material is uniform in mixture is not discussed (Claim 28).

Regarding claim 10, Carcia teach utilizing a sputtering electrode containing at least a part of both a catalyst material and a carrier material. (Column 3 lines 7-21)

Regarding claim 11, Carcia teach the sputtering electrode containing powders of the catalyst and carrier materials to be deposited on the substrate. (Column 6 lines 34-40)

Regarding claim 12, Carcia teach the sputtering electrode containing an alloy of the catalyst material and the carrier material. (Column 3 lines 7-21)

Regarding claim 17, Carcia teach the substrate comprising at least one carrier material. (Column 2 lines 53-59)

Regarding claim 28, Carcia teach the deposition material uniform in mixture. (Column 3 lines 22-25)

The motivation for utilizing the features of Carcia is that it allows for producing catalyst with good catalytic activity and selectivity. (Column 2 lines 32-35)

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Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have utilized the features of Carcia because it allows for producing catalyst with good catalytic activity and selectivity.

Claims 19 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schram et al. in view of Lauth et al. as applied to claims 1-7, 16, 18, 21, 27, 29, 30, 31, 32 and 33 above, and further in view of Cairns et al. (U.S. Pat. 3,969,082).

The differences not yet discussed is the substrate is FeCrAlloy is not discussed (Claim 19) and the substrate being a corrugated material is not discussed (Claim 20).

Regarding claim 19, Cairns et al. teach FeCrAlloy as a substrate for carrying catalytic material. (Column 3 lines 1-9)

Regarding claim 20, Cairns et al. teach the substrate being corrugated. (Column 3 lines 7-9)

The motivation for utilizing the features of Cairns et al. is that it allows for providing a substrate that meets a severe environment. (Column 1 lines 39-43)

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have utilized the features of Cairns et al. is that it allows for providing a substrate that meets a severe environment.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rodney G. McDonald whose telephone number is 571-272-1340. The examiner can normally be reached on M-Th with every Friday off..

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam X. Nguyen can be reached on 571-272-1342. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Rodney G. McDonald/
Primary Examiner, Art Unit 1795

Rodney G. McDonald
Primary Examiner
Art Unit 1795

RM
February 20, 2007